

Installation and Upgrade Guide

For Use with DataFabric® Manager Server 3.6,
Supporting Operations Manager and Protection Manager

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Cryptographic attack detector for ssh - source code

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@version 3.0 (December 2000)

Optimised ANSI C code for the Rijndael cipher (now AES)

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Preface

About this guide

This guide describes the installation and upgrade procedures for the following:

- ◆ DataFabric® Manager 3.6 server
This includes Operations Manager, the Web interface of DataFabric Manager.
- ◆ NetApp® Management Console
This includes Performance Advisor and Protection Manager, as indicated in Chapter 2, “[Downloading and installing NetApp Management Console](#),” on page 27.
- ◆ DataFabric Manager cluster with Microsoft® Cluster Server

DataFabric Manager software is optimized for Network Appliance® storage systems and NetCache® appliances that operate with the Data ONTAP® operating system. The information in this guide applies to all supported hardware and software, as indicated in Chapter 1, “[Before You Start](#),” on page 1.

This guide does not cover system or network administration topics. For administration information, see the Operations Manager *Administration Guide*.

Audience

This guide is written for administrators and others interested in managing storage systems, clusters, or NetCache appliances with DataFabric Manager.

This guide assumes the following:

- ◆ You are familiar with the Data ONTAP operating system software (and the NetCache operating system, if you are managing NetCache appliances).
- ◆ You are familiar with Microsoft Cluster Server, if installing DataFabric Manager on a cluster.
- ◆ You are familiar with the protocols (NFS, CIFS, or HTTP) you use for file sharing or transfers.
- ◆ You are familiar with the client-side operating systems (UNIX® or Windows®).

Terminology conventions in this guide

Storage systems that run Data ONTAP are sometimes also referred to as *filers*, *appliances*, *storage appliances*, or *systems*. The terms used in DataFabric Manager reflect some of these common usages.

When the term *appliance* is used in DataFabric Manager, the information applies to all supported storage systems, NetCache appliances, NearStore® systems, FAS appliances, and in some cases Fibre Channel switches.

When the term *filer* is used, it can refer to any supported storage system, including FAS appliances or NearStore systems.

DataFabric Manager provides infrastructure services for various applications through NetApp Management Console. Examples of management console applications are Performance Advisor and Protection Manager. The DataFabric Manager server is the Windows, Linux®, or Solaris® system on which DataFabric Manager is installed. Services running on DataFabric Manager pass data to the client applications that run in NetApp Management Console. The Performance Advisor software allows viewing of historical and real-time performance data collected from NetApp storage systems. The Protection Manager interface simplifies the managing and monitoring of SnapVault® and SnapMirror® data protection relationships.

Operations Manager is the Web-based user interface of DataFabric Manager, from which you can monitor and manage multiple storage systems, storage system clusters, and NetCache appliances. Operations Manager is used for day-to-day monitoring, alerting, and reporting on storage and NetCache infrastructure.

Path convention

In parenthetical references to paths leading to parts of Operations Manager, the greater-than symbol (>) is used to point to the next interface element connecting you to your final destination.

For example, File Systems > Views > Volume Growth means to select the File Systems tab, open the Views drop-down list and select Volume Growth.

Command conventions

You can enter storage system commands on the system console or from any client that can obtain access to the system using a Telnet session. In examples that illustrate commands executed on a UNIX workstation, the command syntax and output might differ, depending on your version of UNIX.

Typographic conventions

The following table describes the typographic conventions used in this guide.

Convention	Type of information
<i>Italic type</i>	Words or characters that require special attention. Placeholders for information you must supply. For example, the guide might say to enter the following command: <pre>dfm alarm destroy alarm-ids</pre> You must enter the characters “dfm alarm destroy” followed by the ID of the alarm you want to destroy. Book titles in cross-references.
Monospaced font	Command and daemon names. Information displayed on the system console or other computer monitors. The contents of files.
Bold monospaced font	Words or characters you type. What you type is always shown in lowercase letters, unless you must type it in uppercase letters.

Keyboard conventions

This guide uses capitalization and some abbreviations to refer to the keys on the keyboard. The keys on your keyboard might not be labeled exactly as they are in this guide.

What is in this guide...	What it means...
hyphen (-)	Used to separate individual keys. For example, Ctrl-D means holding down the Ctrl key while pressing the D key.
<i>Enter</i>	Used to refer to the key that generates a carriage return; the key is named Return on some keyboards.
<i>type</i>	Used to mean pressing one or more keys on the keyboard.

What is in this guide...	What it means...
<i>enter</i>	Used to mean pressing one or more keys and then pressing the Enter key.

Special messages

This guide contains special messages that are described as follows:

Note

A note contains information that is important for you to consider as you work with the information in this guide.

Attention

An attention notice contains instructions that you must follow to avoid a system crash, loss of data, or damage to the equipment.

About this chapter

This chapter provides you with the following information about DataFabric Manager 3.6:

- ◆ “[Installation and upgrade requirements](#)” on page 2
- ◆ “[Installation and upgrade issues](#)” on page 10

You must read the information in this chapter prior to installing DataFabric Manager software.

Installation and upgrade requirements

About the requirements

Prior to installing or upgrading DataFabric Manager software, you must ensure that you have met requirements in the following areas:

- ◆ Hardware and software requirements
- ◆ License requirements
- ◆ Data ONTAP requirements
- ◆ NetCache requirements

Hardware and software requirements

Your workstation or the DataFabric Manager server must meet the following requirements before you install DataFabric Manager 3.6.

These requirements are recommended for environments with 1 to 25 nodes. For more information about sizing guidelines, see the following section.

Windows 2000 and Windows 2003 servers	
Hardware requirements	Software requirements
◆ Intel®-based PC with single 2-GHz CPU (Xeon® or Pentium® 4) ◆ 4 GB of free disk space minimum, 8 GB recommended ◆ 1 GB of memory minimum	◆ Windows 2000 server (Service Pack 2 or later), 32-bit ◆ Windows 2003 server, 32-bit ◆ Windows 2003 server, 64-bit on x64 (in WOW64 mode)

Windows 2003 servers on VMware® ESX server 3.0.1 or later	
Hardware requirements	Software requirements
◆ Intel-based PC with single 2-GHz CPU (Xeon or Pentium 4) ◆ 4 GB of free disk space minimum, 8 GB recommended ◆ 1 GB of memory minimum ◆ Single dedicated network interface	◆ Windows 2003 server 32-bit (Standard and Enterprise editions)
Solaris 9 and Solaris 10 servers	
Hardware requirements	Software requirements
◆ Dual UltraSPARC IIIi processor at 1.34 GHz (such as Sun Fire™ V120 or V240) ◆ 4 GB of free disk space minimum, 8 GB recommended ◆ 2 GB of memory minimum	◆ Solaris 9 SPARC ◆ Solaris 10 SPARC
Linux workstation or server	
Hardware requirements	Software requirements
◆ Intel-based PC with single 2-GHz CPU (Xeon or Pentium 4) ◆ 4 GB of free disk space minimum, 8 GB recommended ◆ 1 GB of memory minimum	◆ Red Hat™ Enterprise Linux ES 3 (Update 3 or later) for x86, 32-bit ◆ Red Hat Enterprise Linux AS 3 (Update 3 or later) for x86, 32-bit ◆ Red Hat Enterprise Linux AS 4 (Update 3 or later) for x86, 32-bit and 64-bit ◆ SUSE® Linux Enterprise Server 9, (Service Pack 2 or later) for x86, 32-bit and 64-bit

Browser	
	Software requirements
	◆ Microsoft® Internet Explorer® 6.0 or later ◆ Mozilla® FireFox® 1.5 or later ◆ Mozilla Suite 1.7 or later

Note

DataFabric Manager 3.6 is not supported on Windows NT® 4.0, Windows XP, Solaris 8, or distributions of Linux not listed in the preceding table.

DataFabric Manager 3.6 does not support VMware VMotion™ and VMware High Availability features.

These requirements are for a DataFabric Manager installation with only basic system monitoring enabled. If you enable additional features and monitor additional objects, a more powerful platform will probably be required. Examples of objects and features that might require a more powerful platform include additional storage systems, qtrees, user quotas, and use of the Storage Resource Management, Performance Advisor, Business Continuity Option, or Protection Manager features.

Sizing guidelines

You can view the DataFabric Manager *Sizing Guide* on the NetApp Web site at <http://www.netapp.com/library/tr/3440.pdf>. This document provides information that can help you determine the correct configuration for a system to host the DataFabric Manager server.

License requirements

You must have a valid Operations Manager license key to complete the DataFabric Manager installation. You can access your license key from <http://now.netapp.com/licenses>. After you have accessed the site, follow the options provided to access license keys.

After you complete the installation, you can enter additional license keys on the Options page in Operations Manager.

Note

The Operations Manager core license defines the DataFabric Manager system serial number. All optional licenses must have the same serial number as the Operations Manager license.

The following table lists the features supported for each license.

To use...	Install this license...	That enables these features...
Operations Manager	Operations Manager (core) (formerly known as DataFabric Manager Core license) Note Required for all licensed Operations Manager installations. Sets the maximum number of appliances that the DataFabric Manager server can monitor in this installation.	◆ Monitoring ❖ Reports ❖ Storage usage and availability, such as qtrees, volumes, aggregates, LUNs, and disks ❖ Storage systems ❖ vFiler units ❖ NetCache appliances ❖ Real-time streaming events ◆ Managing ❖ Storage system configuration ❖ Scripts ❖ NetCache software and configuration ◆ Monitoring and managing storage system clusters using Cluster Console ◆ Displaying historical and real-time performance data using Performance Advisor in NetApp Management Console
Protection Manager	Operations Manager, NetApp Management Console and Protection Manager (data protection)	◆ Policy-based data protection ◆ Managing SnapVault and SnapMirror relationships ◆ Managing Open Systems SnapVault® ◆ Managing data protection schedules, alarms, and groups ◆ Managing and monitoring resource pools and data sets

To use...	Install this license...	That enables these features...
File Storage Resource Manager (File SRM)	Operations Manager, and File SRM Option	Tracking file system usage and capacity information
Business Continuity	Operations Manager, and Business Continuity Option (BCO)	◆ Backup Manager Configuring and scheduling disk-to-disk backups of all systems enabled with SnapVault, including Open Systems SnapVault ◆ Disaster Recovery Manager ❖ Monitoring SnapMirror relationships ❖ Configuring and scheduling disk-to-disk mirrors of all systems enabled with SnapMirror
Storage Area Network	Operations Manager, and Storage Area Network Option	◆ Monitoring and managing SAN hosts and FC switches ◆ Managing LUNs on Windows SAN hosts

Note

NetApp has announced the end of availability for the BCO and SAN licenses. The DataFabric Manager customers should check with their NetApp sales representative regarding other NetApp SAN management solutions.

Data ONTAP requirements

The following Data ONTAP requirements apply to DataFabric Manager 3.6.

To use...	The system must be running...
Aggregate and flexible volume management features	Data ONTAP 7.0 or later.
Backup management features	Data ONTAP 6.4 or later.
Configuration management features	Data ONTAP 6.5.1 or later.
Disaster Recovery features	Data ONTAP 6.2 or later to monitor SnapMirror relationships. Data ONTAP 6.5 or later to manage SnapMirror® relationships.
Fibre Channel performance monitoring features	Data ONTAP 6.4.
Fibre Channel switch monitoring features	Data ONTAP 6.3 or later.
Performance Advisor features	Data ONTAP 6.5 or later.
Physical space monitoring information	Data ONTAP 6.5 or later.
Monitoring SnapMirror relationships	Data ONTAP 6.2 or later.
Managing SnapMirror relationships	Data ONTAP 6.5 or later.
User quota editing feature	Data ONTAP 6.4 or later.
User quota editing feature for vFiler™ units	Data ONTAP 6.5.1 or later.
User quota monitoring and LUN monitoring	Data ONTAP 6.3 or later.
vFiler unit monitoring	Data ONTAP 6.5 or later.

Note

For configuring multiple appliances across multiple Data ONTAP software versions, a DataFabric Manager plug-in is required for the version of Data ONTAP you are running. DataFabric Manager ships with the plug-ins for Data ONTAP 6.5.1 and later. To list the versions of the plug-ins for Data ONTAP, use the `dfm plugin list` command at the command line. You do not need to download a plug-in unless you are using a different version of Data ONTAP.

**NetCache
requirements**

The following NetCache requirements apply to DataFabric Manager 3.6.

To use...	The NetCache appliances must be running...
Monitoring and managing NetCache appliances	NetCache 5.0 or later.
NetCache configuration management and the NetCache software upgrade features	NetCache 5.3.1 or later.
Distribution Management feature	NetCache 5.4R2 or later.
Appliance-initiated discovery feature	NetCache 5.4R2 or later.

Note

For multiple-appliance configurations across multiple NetCache software versions, DataFabric Manager must include a plug-in for NetCache 5.3.1 and later.

NetCache 5.3 configurations must be upgraded to later versions after installing DataFabric Manager.

For Windows and Solaris platforms, DataFabric Manager ships with the plug-ins for NetCache 5.3.1 and later.

For Linux platforms, DataFabric Manager ships with the plug-ins for NetCache 6.0 and later.

To list the versions of the plug-ins for NetCache, use the `dfm plugin list` command at the command line. You do not need to download a plug-in unless you will be using a different version of NetCache.

Installation and upgrade issues

About this section

With every release of DataFabric Manager, it is recommended that you understand the changes in the system behavior. You might also have to resolve issues before upgrading. This section provides you with information that you should review prior to installing or upgrading to DataFabric Manager 3.6.

Deploying DataFabric Manager software

You must deploy DataFabric Manager on a system that is running no other applications. When you purchase DataFabric Manager, you need to download the Operations Manager license from the NOW™NetApp on the Web™ site. You can install other licenses only after installing the Operations Manager license.

Upgrading from DataFabric Manager 3.5 or earlier

If you are upgrading from DataFabric Manager 3.5 or earlier to DataFabric Manager 3.6, the time taken to upgrade the performance data files (data of 20 GB or more) is long. The length of time is dependent on the platform used. The space used by the performance data files increases by about 65% during the upgrade.

Upgrading from DataFabric Manager 3.3 or 3.4 to 3.5 or later

DataFabric Manager 3.3 and 3.4 reported vFiler units by their names. After an upgrade to DataFabric Manager 3.5 or later, the DNS names of vFiler units will be reported, if configured.

Upgrading from DataFabric Manager 3.2 or earlier

Because of database schema changes, you might experience a delay of several minutes to a few hours when upgrading from DataFabric Manager 3.2 or earlier. The time required to perform the upgrade depends on the size of the database, the amount of history in the database, the CPU speed, and the I/O throughput of the system. The following processes might require a lot of time:

- ◆ Merging rotating history tables
- ◆ Populating history tables
- ◆ Populating volume history tables
- ◆ Populating aggregate history tables
- ◆ Reloading the database into the latest file format (at the end of upgrade)

Upgrading from DataFabric Manager 3.1

After an upgrade from DataFabric Manager 3.1, Last Backup Status of All Primary Directories in Storage Systems under the Backup Manager tab is shown as unknown.

This issue gets resolved after DataFabric Manager runs a backup job for the relationship.

Upgrading from DataFabric Manager 2.2 or earlier, on Solaris

Versions of DataFabric Manager earlier than 3.3 supported Solaris 8. Because DataFabric Manager 3.3 and later supports only Solaris 9 and 10, you cannot upgrade directly to DataFabric Manager 3.6 from DataFabric Manager 1.1 to 2.2 on Solaris. You must upgrade to DataFabric Manager 2.3 or later, upgrade the operating system to Solaris 9, and then upgrade to DataFabric Manager 3.6.

Upgrading from DataFabric Manager 2.1 or earlier, on Windows

Because of a database upgrade that is no longer supported on a Windows platform, you must first upgrade to DataFabric Manager 2.2 or later (up to DataFabric Manager 3.2) before you upgrade to DataFabric Manager 3.6.

Supported upgrade methods from Windows 2000 to Windows 2003

If you currently run DataFabric Manager software on Windows 2000, upgrade to DataFabric Manager 3.0.1 or later and then upgrade the operating system to Windows 2003.

If you have Windows 2003 already installed on another system, install DataFabric Manager 3.6 on it and then migrate the database from the Windows 2000 system.

For information about database backup, see the section on Setting up the DataFabric Manager database backup in the Operations Manager *Administration Guide*. For information about migrating the database, see “[Migrating the DataFabric Manager data to a different location](#)” on page 30.

Windows installation path for DataFabric Manager

Installing DataFabric Manager 3.6: The default installation path for DataFabric Manager 3.6 on a Windows platform is C:\Program Files\NetApp\DataFabric.

Upgrading to DataFabric Manager 3.6: On upgrading to DataFabric Manager 3.6, the default installation path will remain unchanged. The default installation path in the earlier versions of DataFabric Manager is C:\Program Files\Network Appliance\DataFabric.

Windows 2003 default browser security setting recommendations

After Windows 2003 is installed, the default security setting for the browser is set to “high.” This setting can cause the browser to block certain actions that can interfere with your DataFabric Manager upgrade.

To ensure the best browsing experience when using DataFabric Manager, you might need to adjust your browser security setting to “medium.”

Resolving port conflicts

You might not be able to establish communication between the DataFabric Manager server and its appliances, if port conflicts are not resolved. To ensure seamless communication, ensure that no application except DataFabric Manager uses the following ports: 8080, 8443, 8088, 8488, and 162. For more information, see the FAQ section in online Help.

Installing DataFabric Manager in a custom Linux directory

If you used the `-d <new directory>` command to install DataFabric Manager 3.2 or earlier in a custom directory, the DataFabric Manager software was installed in an NTAPdfm directory that was automatically created within the new directory you specified.

If you use the `-d <new directory>` command to install DataFabric Manager 3.3 or later in a custom directory, DataFabric Manager is installed in the new directory you specify; no additional NTAPdfm directory is created.

Blocking access to Web servers

DataFabric Manager allows search engines to crawl and index the Web pages in Operations Manager. If you want to block access by search engines to the Web pages, create a file called `robots.txt` in the directory `<install-path>/DFM/web`. If the file contains only the following text, search engines will not crawl or index Operations Manager Web pages:

```
User-agent: *
```

```
Disallow: /
```

Viewing dynamic data

To use Disaster Recovery, the browser that you use to view Operations Manager must support Java applets.

Conversion of group names from version 3.1 or earlier

The naming convention for hierarchical groups uses the forward slash character (/) as a separator between levels in the hierarchy. If you upgrade from DataFabric Manager 3.1 or earlier, any group that uses the forward slash character in its name will be renamed so that the group is not mistaken for a subgroup in a hierarchy. Each forward slash character will be replaced by a hyphen character (-).

If the new name is already in use by another group, DataFabric Manager will add an increasing numeric suffix to the name until an unused name is derived. For example, DataFabric Manager would try to rename group apple/orange to apple-orange, then to apple-orange1, then to apple-orange2, and so on, until an unused group name is found.

Upgrade considerations for configuration groups

After upgrading from version 3.1 or earlier, some administrators of configuration resource groups might gain additional privileges through inheritance. Before upgrading, be sure to review the privileges for group hierarchies that include configuration resource groups and make adjustments as necessary.

About this chapter

The following topics are described in this chapter:

- ◆ “[Installing DataFabric Manager 3.6 on Windows](#)” on page 16
- ◆ “[Installing DataFabric Manager 3.6 on Solaris](#)” on page 19
- ◆ “[Installing DataFabric Manager 3.6 on Linux](#)” on page 23
- ◆ “[Installing licenses](#)” on page 26
- ◆ “[Downloading and installing NetApp Management Console](#)” on page 27
- ◆ “[Migrating the DataFabric Manager data to a different location](#)” on page 30
- ◆ “[Configuring database for Snapshot based backups](#)” on page 31

Note

If you are upgrading from a previous version of DataFabric Manager, see the section on Setting up the DataFabric Manager database backup in the *Operations Manager Administration Guide*.

Installing DataFabric Manager 3.6 on Windows

About this section

This section provides you with the following information:

- ◆ “[Installing DataFabric Manager on Windows](#)” on page 16
- ◆ “[Uninstalling DataFabric Manager on Windows](#)” on page 18

**Installing
DataFabric Manager
on Windows**

To install DataFabric Manager 3.6 on your Windows 2000 or 2003 DataFabric Manager server, complete the following steps.

Note_____

The installation software automatically detects and stops any DataFabric Manager services that are running on the system. Therefore, you do not need to manually stop DataFabric Manager services before starting the upgrade process.

Step	Action
1	Ensure the following: ◆ Your workstation meets the requirements described in “Installation and upgrade requirements” on page 2. ◆ You have the information required to complete the installation, as described in “Installation and upgrade requirements” on page 2.” ◆ You have Local Administrator login permission for the DataFabric Manager server.

Step	Action	
2	If you are...	Then...
	Upgrading to DataFabric Manager 3.6	Back up your existing DataFabric Manager database. ◆ During the upgrade: The DataFabric Manager 3.6 install wizard includes a backup step in which you can choose to back up your database during the upgrade. If the backup does not finish successfully, abort the install wizard, perform a manual backup, and then restart the installation. ◆ Before the upgrade: If you choose to skip the backup step during the upgrade, you should back up the database before you start the install wizard. For instructions, see the section on Setting up the DataFabric Manager database backup in the <i>Operations Manager Administration Guide</i>.
	Installing DataFabric Manager 3.6	Go to Step 3 .
3	Insert the DataFabric Manager 3.6 CD into the CD drive of your management station.	
4	Launch dfmsetup-3-6-win32.exe in the /dfm/installer/ directory on the CD.	

Step	Action
5	Follow the DataFabric Manager setup prompts to complete the installation. Note_____ The installation process can take several minutes. _____ During a new installation, you must specify the Operations Manager license key. If you are upgrading from an earlier licensed version of DataFabric Manager, you do not need a license key. The DataFabric Manager 3.6 installation and upgrade process automatically installs the AutoSupport feature with AutoSupport enabled and displays a message about how to disable the feature. To disable AutoSupport, use the following command: dfm option set autosupportEnabled=no

After the installation is complete, Operations Manager launches automatically.

Uninstalling DataFabric Manager on Windows

To uninstall DataFabric Manager, complete the following steps.

Step	Action
1	From the Start menu, select Settings > Control Panel > Add/Remove Programs.
2	From the list of applications, select NetApp DataFabric Manager.
3	Click the Remove button.
4	Follow the prompts to uninstall the software.

During the uninstallation process, DataFabric Manager saves the log files and the database file to a temporary directory named DFM-*<date, year, month, day, hour, minute, second>*, if it has permissions to create the directory. If DataFabric Manager does not have sufficient permissions, the database file and the log files will be left in place.

Installing DataFabric Manager 3.6 on Solaris

About this section

This section provides you with the following information:

- ◆ “[Installing DataFabric Manager on Solaris](#)” on page 19
- ◆ “[Uninstalling DataFabric Manager on Solaris](#)” on page 22

**Installing
DataFabric Manager
on Solaris**

To install DataFabric Manager 3.6 on your Solaris DataFabric Manager server, complete the following steps.

Note_____

The installation software automatically detects and stops any DataFabric Manager services that are running on the system. Therefore, you do not need to manually stop DataFabric Manager services before starting the upgrade process.

Step	Action
1	Ensure the following: ◆ Your DataFabric Manager server meets the requirements described in “Installation and upgrade requirements” on page 2. ◆ You have the information required to complete the installation, as described in “Installation and upgrade requirements” on page 2. ◆ You have root user login permissions for the DataFabric Manager server.

Step	Action	
2	If you are...	Then...
	Upgrading to DataFabric Manager 3.6	Back up your existing DataFabric Manager database. ◆ During the upgrade: The DataFabric Manager 3.6 install wizard includes a backup step in which you can choose to back up your database during the upgrade. If you choose this option, the DataFabric Manager SQL service must be running to perform the backup. If the backup does not finish successfully, abort the install wizard, perform a manual backup, and then restart the installation. ◆ Before the upgrade: If you choose to skip the backup step during the upgrade, you should back up the database before you start the install wizard. For instructions, see the section on Setting up the DataFabric Manager database backup in the Operations Manager <i>Administration Guide</i>.
	Installing DataFabric Manager 3.6	Go to Step 3 .
3	Insert the DataFabric Manager 3.6 CD into the CD drive of your DataFabric Manager server.	
4	Launch dfmsetup-3-6-solaris.sh in the /dfm/installer/ directory from the CD.	

Step	Action
5	Follow the DataFabric Manager setup prompts to complete the installation. Note The installation process can take several minutes. By default, DataFabric Manager installs itself in the /opt/NTAPdfm directory. To change the installation directory, use the <code>-d <new directory></code> command-line option. During a new installation, you must specify the Operations Manager license key. If you are upgrading from an earlier licensed version of DataFabric Manager, you do not need a license key. During the installation process, the setup will prompt for the installation of the following files with <code>setuid</code> or <code>setgid</code> permissions in the /opt/NTAPdfm/sbin directory: ◆ <code>chkw</code> ◆ <code>chkw_pam</code> ◆ <code>dfmping</code> A local user will not be able to log in to Operations Manager, if the permissions are not set. The DataFabric Manager 3.6 installation and upgrade process automatically installs the AutoSupport feature with AutoSupport enabled and displays a message about how to disable the feature. To disable AutoSupport, use the following command: <code>dfm option set autosupportEnabled=no</code>

Uninstalling DataFabric Manager on Solaris

To uninstall DataFabric Manager, complete the following step.

Note

To uninstall the software, you must have administrative privileges for the DataFabric Manager server.

Step	Action
1	Use the following UNIX command: pkgrm NTAPdfm

During the uninstallation process, DataFabric Manager saves the log files and the database file to a temporary directory named NTAPdfm- *<year, month, day, hour, minute, second>*, if it has permissions to create the directory. If DataFabric Manager does not have sufficient permissions, the database file and the log files are left in place.

Installing DataFabric Manager 3.6 on Linux

About this section

This section provides you with the following information:

- ◆ “[Installing DataFabric Manager on Linux](#)” on page 23
- ◆ “[Uninstalling DataFabric Manager on Linux](#)” on page 25

**Installing
DataFabric Manager
on Linux**

To install DataFabric Manager 3.6 on your Linux DataFabric Manager server, complete the following steps.

Step	Action
1	Ensure the following: ◆ Your DataFabric Manager server meets the requirements described in “Installation and upgrade requirements” on page 2. ◆ You have the information required to complete the installation, as described in “Installation and upgrade requirements” on page 2. ◆ You have root user login permissions for the DataFabric Manager server.

Step	Action	
2	If you are...	Then...
	Upgrading to DataFabric Manager 3.6	Back up your existing DataFabric Manager database. ◆ During the upgrade: The DataFabric Manager 3.6 install wizard includes a backup step in which you can choose to back up your database during the upgrade. If you choose this option, the DataFabric Manager SQL service must be running to perform the backup. If the backup does not complete successfully, abort the install wizard, perform a manual backup, and then restart the installation. ◆ Before the upgrade: If you choose to skip the backup step during the upgrade, you should back up the database before you start the install wizard. For instructions, see the section on Setting up the DataFabric Manager database backup in the <i>Operations Manager Administration Guide</i>.
	Installing DataFabric Manager 3.6	Go to Step 3 .
3	Insert the DataFabric Manager 3.6 CD into the CD drive of your management station.	
4	Launch dfmsetup-3-6-linux.sh in the /dfm/installer/ directory from the CD.	

Step	Action
5	Follow the DataFabric Manager setup prompts to complete the installation. Note_____ The installation process can take several minutes. _____ By default, DataFabric Manager installs itself in the /opt directory. To change the installation directory, use the <code>-d <new directory></code> command-line option. During a new installation, you must specify the Operations Manager license key. If you are upgrading from an earlier licensed version of DataFabric Manager, you do not need a license key. The DataFabric Manager 3.6 installation and upgrade process automatically installs the AutoSupport feature with AutoSupport enabled and displays a message about how to disable the feature. To disable AutoSupport, use the following command: dfm option set autosupportEnabled=no

Uninstalling DataFabric Manager on Linux

To uninstall DataFabric Manager, complete the following step.

Note_____

You must have root user login permission for the DataFabric Manager server.

Step	Action
1	Use one of the following Red Hat Linux commands: ◆ rpm -e NTAPdfm ◆ rpm --erase NTAPdfm

During the uninstallation process, DataFabric Manager saves the log files and the database file to a temporary directory named NTAPdfm- *<year, month, day, hour, minute, second>*, if it has permissions to create the directory. If DataFabric Manager does not have sufficient permissions, the database file and the log files will be left in place.

Installing licenses

About license keys Each DataFabric Manager installation requires an Operations Manager license with a unique serial number. You must install the Operations Manager license before you install any other licenses for DataFabric Manager features.

For DataFabric Manager features that require licenses, you must install the license key before you enable the feature. Each feature license must have the same serial number as the Operations Manager license. You can install these licenses in any order.

Installing license keys You can install license keys when you install the Operations Manager license. You can also install them any time later, from the Options page on Operations Manager.

To install license keys from the Options page, complete the following steps.

Step	Action
1	From any page, select Options from the Setup menu. The Options page is displayed.
2	In the Edit Options list (in the left pane), click Licensed Features. The Licensed Features Options page is displayed.
3	In the New License Key field, enter the key for the new license and click Update.

Downloading and installing NetApp Management Console

Function of NetApp Management Console

NetApp Management Console is a client software that contains a number of storage system management applications. NetApp Management Console incorporates the following:

- ◆ Performance Advisor application: allows viewing of historical and real-time performance data collected from NetApp storage systems
- ◆ Protection Manager application: provides policy-based data protection by using NetApp storage systems that have SnapVault, Open Systems SnapVault, or SnapMirror licenses

To use the preceding features, you must download and install NetApp Management Console.

Location of download links

You can download the NetApp Management Console application from the NetApp Management Console Software page in Operations Manager. From the Setup menu, select Download Management Console. This page contains links to the Windows, Solaris, and Linux downloads.

NetApp Management Console system requirements

NetApp Management Console runs on Windows 2000, Windows 2003, Windows XP, Solaris, Red Hat Linux, and SUSE Linux platforms.

You should not install NetApp Management Console on the DataFabric Manager server. Installing the console on the server can have a negative impact on server performance.

Installing NetApp Management Console

To install NetApp Management Console on your Windows, Solaris, or Linux system, complete the following steps.

Note

If an earlier version of NetApp Management Console is installed on your system, close the client before installing the latest version, so that the uninstall of the old client performs correctly. NetApp Management Console 2.1 is supported only on DataFabric Manager 3.6. (DataFabric Manager 3.6 also supports NetApp Management Console 2.0.)

Step	Action	
1	Click the link for the version of NetApp Management Console required for your operating system: Windows, Solaris, or Linux.	
2	If you are installing on....	Then launch...
	Windows	nmconsole-setup-2-1-win32.exe.
	Solaris	nmconsole-setup-2-1-solaris.sh.
	Linux	nmconsole-setup-2-1-linux.sh.
3	Follow the setup prompts to complete the installation. Note _____ The default installation path for the NetApp Management Console on Windows is C:\Program Files\NetApp\Management Console\. You can access NetApp Management Console from the Start menu at Programs > NetApp > Management Console > NetApp Management Console.	

For instructions on how to start and use NetApp Management Console, see the Operations Manager *Administration Guide* and the online Help.

Locating information about the client configuration

From the Help menu in NetApp Management Console, you can select the About option to get the following information about the software:

- ◆ Application Name
- ◆ Build String
- ◆ Version String
- ◆ Copyright

In the About dialog box, click the Configuration Details button to get more specific information about the configuration of the client running NetApp Management Console, such as the following:

- ◆ NetApp Management Console installation directory
- ◆ Operating system architecture, name, and version
- ◆ Java version and associated memory

- ◆ DataFabric Manager version, serial number, host name, installation directory, and so on

This type of information can be useful when you are troubleshooting problems or preparing to install software upgrades.

Migrating the DataFabric Manager data to a different location

You can migrate the DataFabric Manager data to a different location using the `dfm datastore setup <dfm-data-dir>` command, where *dfm-data-dir* is the target location for the DataFabric Manager data. Besides configuring the DataFabric Manager database, this command copies the database, performance data, and script plug-in files in the specified target directory.

You can specify the target directories for the DataFabric Manager database, the script plug-ins, and the performance data by using the `dfm datastore setup -d <db-dir> -p <perf-dir> -s <script-plugins-dir>` command. The `-d`, `-p`, and `-s` options are used to set new locations for the DataFabric Manager database, performance data, and script plug-ins, respectively.

You can set up the DataFabric Manager server to use the data present at the new location by using the `dfm datastore setup -n <dfm-data-dir>` command. The `-n` option updates the configuration of the DataFabric Manager database to use the new data without copying the original data.

Example:

```
$ dfm datastore setup -n /mnt/dfm
```

Note

Do not run any *dfm command* while migrating the DataFabric Manager data. If some commands are run, they can interfere with the migrate operation by locking the database tables and causing the operation to fail.

Configuring database for Snapshot based backups

You can quicken the backup process by using the Snapshot based approach under the following conditions:

- ◆ The DataFabric Manager data resides on a NetApp LUN using either FCP or iSCSI.
- ◆ The volume holding the DataFabric Manager data is appropriately configured for SAN storage. For more details, see <http://www.netapp.com/library/tr/3483.pdf>.

In this approach, it is recommended that you disable the default Snapshot copies for the volume holding the DataFabric Manager data.

For more information about backups, see the section on Setting up the DataFabric Manager database backup in the Operations Manager *Administration Guide*.

To configure the DataFabric Manager database for Snapshot based backups, complete the following steps.

Step	Action	
1	Install SnapDrive®.	
	If you are installing on....	Then use...
	Windows: ◆ Windows 2003 SP1 or SP2 ◆ Windows 2003 R2 ◆ Windows 2000 SP4	SnapDrive 4.1 for Windows or higher. Note _____ SnapDrive 5 for Windows is not compatible with the Windows 2000 operating system. _____
	Solaris: ◆ FCP ❖ Solaris 9 ❖ Solaris 10 update 1 ◆ iSCSI ❖ Solaris 9 (Only H/W iSCSI initiator) ❖ Solaris 10 update 1 (Only S/W iSCSI initiator)	SnapDrive 2.2 for UNIX or higher.
	Linux: ◆ SUSE ❖ SLES9 (SP3) ◆ Red Hat ❖ Red Hat Enterprise Linux 3.0 Update 4 ❖ Red Hat Enterprise Linux 3.0 Update 5 - FCP ❖ Red Hat Enterprise Linux 4.0 Update 3	SnapDrive 2.2.1 for UNIX or higher.

Step	Action
2	Create FCP- or iSCSI-based storage using SnapDrive.
3	Enter the following command at the command line: <pre>dfm datastore setup <dfm-data-dir></pre> <i>dfm-data-dir</i> is the target location for the DataFabric Manager data.

About this chapter

This chapter describes how to configure DataFabric Manager 3.3 or later for high availability, using Microsoft Cluster Server (MSCS).

You must read the information in this chapter prior to installing DataFabric Manager software.

Note

Do not install DataFabric Manager until after you install MSCS, following the installation requirements and instructions provided in the Microsoft documentation.

The following topics are described in this chapter:

- ◆ [“Planning to install DataFabric Manager with MSCS”](#) on page 36
- ◆ [“Setting up DataFabric Manager with MSCS using configuration scripts”](#) on page 45
- ◆ [“Setting up DataFabric Manager with MSCS using manual steps”](#) on page 50
- ◆ [“Managing DataFabric Manager with MSCS”](#) on page 59
- ◆ [“Upgrading cluster nodes with DataFabric Manager”](#) on page 66

Planning to install DataFabric Manager with MSCS

How DataFabric Manager with MSCS works

A cluster (active/active configuration) configured with DataFabric Manager consists of two nodes running DataFabric Manager 3.3 or later and configured for high availability using MSCS.

You configure DataFabric Manager services to be accessible through a network name and network address. Operations Manager and NetApp Management Console can also use this network name or network address, so you do not need to add new network resources for the DataFabric Manager services. All DataFabric Manager data (database files, Performance Advisor files, and so on) are configured to be accessed from a shared data disk.

Cluster resources incorporate all the hardware and software components that exist in a cluster. This includes the DataFabric Manager services, the shared data disks, the network name, and the network address, among other components. At any time, these resources are all online on one of the two cluster nodes.

When any failure is detected, whether a node failure or a failure of one of the resources, all the resources are automatically moved, or failed over, to the partner node by MSCS.

This failover process is assisted by using a quorum resource on the cluster. The quorum resource is a physical storage device that can be accessed by both nodes in the cluster, although only one node has access to the quorum resource at any given time. The node that has access to the quorum resource is the node that has control of the cluster resource.

Overview of installing DataFabric Manager with MSCS

The overall process for using DataFabric Manager in a MSCS environment is as follows:

1. Install MSCS according to installation instructions provided by Microsoft and the following guidelines for DataFabric Manager:
 - ❖ See “[Supported configurations for DataFabric Manager with MSCS](#)” on page 37.
 - ❖ Modify the MSCS configuration for DataFabric Manager.
 - ❖ Configure MSCS with a shared data disk for a quorum resource, a network name, and a network address.
 - ❖ Place these cluster resources in a cluster resource group.

- ❖ See “[MSCS configuration requirements](#)” on page 38.
- 2. Configure the cluster nodes in preparation for the DataFabric Manager installation.
 - ❖ Set up new resources: domain users, shared data disks, and folders.
 - ❖ Add the new resources to the cluster resource group.
 - ❖ See “[Preparing to install DataFabric Manager with MSCS](#)” on page 39.
- 3. Install DataFabric Manager.

See “[Installing DataFabric Manager with MSCS](#)” on page 41.
- 4. Configure DataFabric Manager with configuration scripts or manually.

See “[Setting up DataFabric Manager with MSCS using configuration scripts](#)” on page 45 or “[Setting up DataFabric Manager with MSCS using manual steps](#)” on page 50.

Note

You should perform all cluster operations by using either Cluster Administrator or `cluster.exe`. Except where specifically indicated in installation and configuration procedures, do *not* use `dfm service start` and `dfm service stop`. These commands interfere with cluster operations.

Supported configurations for DataFabric Manager with MSCS

DataFabric Manager with MSCS is supported in the following configuration:

- ◆ Microsoft Windows servers running Windows 2003 Enterprise Edition or Data Center Edition, running the same patch versions on identical hardware
- ◆ Only two nodes in the cluster setup
- ◆ Fibre Channel switched fabric or iSCSI-based storage for shared data disks with a NetApp storage system as the storage back end
- ◆ Only the Single Quorum Device Cluster setup
- ◆ The same version of DataFabric Manager installed at the same path on both the cluster nodes, for example, `C:\Program Files\NetApp\DataFabric\DFM`
- ◆ All DataFabric Manager administrators as domain users rather than local system users so that the user login works even when the DataFabric Manager services fail over to the partner node

Note

DataFabric Manager with MSCS is not supported on VMware.

MSCS configuration requirements

Before installing DataFabric Manager with MSCS, you must set up two Windows servers running on identical hardware platforms. Ensure that all the requirements and guidelines for setting up cluster servers are followed, according to the MSCS documentation.

The configuration described in this document assumes that during the setup of MSCS you completed the following actions:

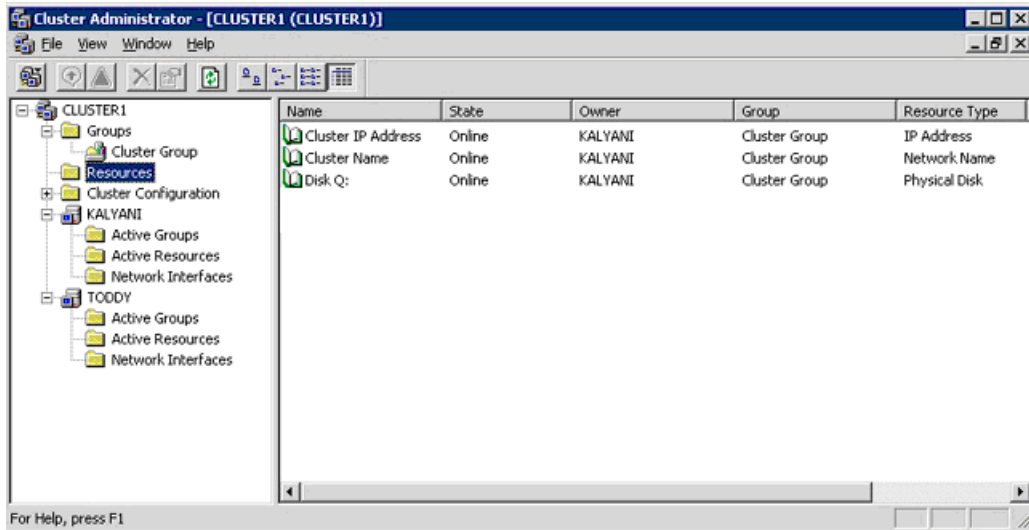
- ◆ Created a shared data disk to be used as a quorum resource
The shared quorum disk is used for storing the cluster configuration information.
- ◆ Created a network name resource and a network address resource
The network name and network address are used for managing the cluster server and DataFabric Manager.
- ◆ Added these cluster resources to a resource group
Putting the resources in a group makes all the resources available to both cluster nodes.

This is the configuration described in this document.

Example of a MSCS initial setup

The following image presents an example of a Cluster Administrator display after initial setup of MSCS. The example shows the resources, nodes, and groups as they would appear, assuming the following configuration:

- ◆ Cluster name is Cluster 1
- ◆ First node name is Kalyani
- ◆ Second node name is Toddy
- ◆ Physical disk, the shared disk quorum resource, is created with the name Disk Q: and is mapped to drive letter Q:
- ◆ Network Name resource is called Cluster Name
- ◆ Network IP Address resource is called Cluster IP Address
- ◆ All of the above resources are added to a resource group named Cluster Group



You can also set up DataFabric Manager to use a different network name and network address. You can add these resources, along with the DataFabric Manager service resources and shared data disk resource, to another resource group.

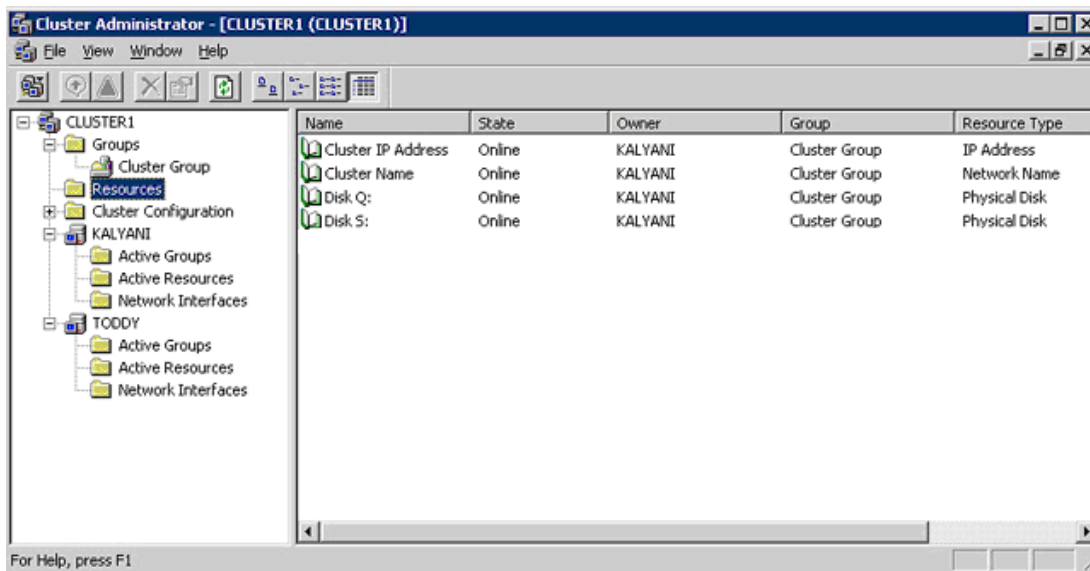
Preparing to install DataFabric Manager with MSCS

Before installing DataFabric Manager, you must set up users and shared resources, as indicated in the following procedure.

Step	Action
1	Select a domain user and add the domain user to the Administrators Group on both cluster nodes. Example: domain\dfmuser

Step	Action
2	Create a shared data disk: a. Make the disk accessible to both the cluster nodes. b. Map the disk to a drive letter, for example, drive S:. Note _____ The data disk should be mapped to the same drive letter on both the cluster nodes. c. Add the shared data disk, as a physical disk resource, to the cluster server. This disk is a resource for storing data specific to DataFabric Manager.
3	Create a folder named “dfm,” inside the shared data disk. Give the domain user full control access to the folder. This folder holds all the DataFabric Manager data.
4	Verify that the resource group named Cluster Group can successfully fail over to the partner node.

After completing these tasks, the Cluster Administrator displays the resources, nodes, and groups as shown in the following image. In addition to the content displayed after the initial setup, Cluster Administrator now shows a physical disk resource named Disk S:.



Installing DataFabric Manager with MSCS

For details about the DataFabric Manager installation process, see Chapter 2, “[Installing and Upgrading DataFabric Manager](#),” on page 15.

Prerequisites:

- ◆ Microsoft Cluster Server must be properly installed and configured on both nodes of the cluster. Also, the pre-installation tasks discussed in "Preparing to install DataFabric Manager with MSCS" must be completed.
- ◆ Your workstation must meet the requirements described in "Installation and upgrade requirements."
- ◆ Ensure you have the information required to complete the installation, as described in "Installation and upgrade requirements."
- ◆ You must have Local Administrator login permission for the DataFabric Manager server.

To install DataFabric Manager on the cluster nodes, complete the following steps.

Step	Action
1	Log in to the first node of the cluster pair as a domain user with administrator privileges on the local system.

Step	Action	
2	Ensure that this node owns the cluster resources. In the Cluster Administrator interface, check the Owner field of the Resources folder.	
3	If you are...	Then...
	Upgrading to DataFabric Manager 3.6	Back up your existing DataFabric Manager database. ◆ During the upgrade: The DataFabric Manager 3.6 install wizard includes a backup step in which you can choose to back up your database during the upgrade. If the backup does not finish successfully, abort the install wizard, perform a manual backup, and then restart the installation. ◆ Before the upgrade: If you choose to skip the backup step during the upgrade, you should back up the database before you start the install wizard. For instructions, see the section on Setting up the DataFabric Manager database backup in the <i>Operations Manager Administration Guide</i>.
	Installing DataFabric Manager 3.6	Go to Step 4 .
4	Insert the DataFabric Manager 3.6 CD into the CD drive of your DataFabric Manager server.	
5	Insert the DataFabric Manager 3.6 CD. Launch dfmsetup-3-6-win32.exe in the /dfm/installer/ directory from the CD.	

Step	Action
6	Follow the DataFabric Manager setup prompts to complete the installation. Note the installation directory path for later reference. Example: C:\Program Files\NetApp\DataFabric\DFM Note_____ The installation process can take several minutes. _____ During a new installation, you must specify the Operations Manager license key. If you are upgrading from an earlier licensed version of DataFabric Manager, you do not need a license key. The DataFabric Manager 3.6 installation and upgrade process automatically installs the AutoSupport feature with AutoSupport enabled and displays a message about how to disable the feature. To disable AutoSupport, use the following command: dfm option set autosupportEnabled=no
7	When installation is complete, stop the DataFabric Manager services: \$ dfm service stop
8	Move the cluster resources to the second node by using the Move Group option.
9	Log in to the second node of the cluster pair, as a domain user with administrator privileges on the local system. You must log in with the same user name you used on the first node, in Step 1.
10	Install DataFabric Manager at the same directory path that you used on the first node.
11	Enter the following command to stop the DataFabric Manager services: \$ dfm service stop

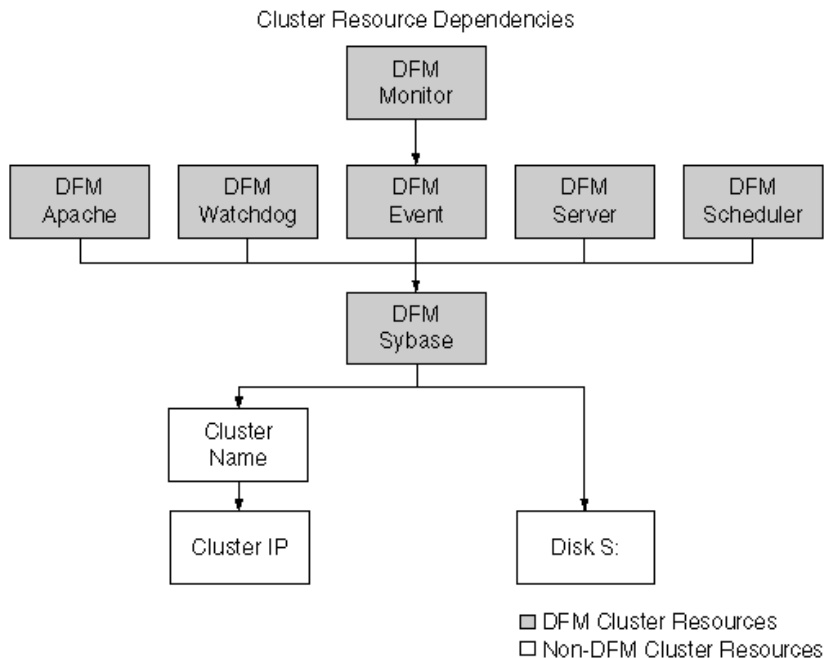
Note

Because the two DataFabric Manager nodes are configured to use the same database and to monitor the same set of nodes, you can use the same set of licenses for installation on both the nodes.

Block diagram of DataFabric Manager services and cluster resources

After completing the DataFabric Manager installations on both nodes of the cluster, you can configure them for high availability. You can perform set up configuration by using the configuration scripts that are provided with the installation, or you can perform the configuration manually.

The following block diagram describes the DataFabric Manager service resources that you need to add to MSCS and the dependencies among the various resources.



Setting up DataFabric Manager with MSCS using configuration scripts

Types of configuration scripts

There are three configuration scripts you can use to configure the DataFabric Manager with MSCS. These Perl scripts are installed along with DataFabric Manager and can be found at *<install-folder>\examples*. You should run these scripts in the following order and locations:

- 1. `dfmcluster_firstnode.pl`: on the first cluster node
- 2. `dfmcluster_secondnode.pl`: on the second cluster node
- 3. `dfmcluster_add_resources.pl`: on the first or second cluster node

If you want to set up the cluster manually, go to [“Setting up DataFabric Manager with MSCS using manual steps”](#) on page 50.

First cluster node setup script

You use this cluster setup script to configure the first DataFabric Manager cluster node. Before running the script, ensure that you are logged in as the selected domain user. Verify that the first node owns all the cluster resources by reviewing the Resources details pane.

dfmcluster_firstnode.pl syntax:

```
perl dfmcluster_firstnode.pl <option> ...
```

For example, run this script as

```
$ perl dfmcluster_firstnode.pl -u "domain\dfmuser" -p ***** -s "C:\Program Files\NetApp\DataFabric\DFM" -d "S:\dfm"
```

Option	Description
-u <domain-user-name>	Domain user who has administrator privileges on the local system
-p <password>	Password for the domain user
-s <dfm-install-dir>	DataFabric Manager installation path This is the path from which data is moved to the shared data disk. This should be the same as the dfm about output.

Option	Description
-d <data-path>	Path to a destination folder in the shared data disk, to which the DataFabric Manager database and other files are moved

dfmcluster_firstnode.pl operations:

This cluster setup script performs the following operations:

- ◆ Configures services not to start automatically when the node boots up, by setting service startup type to `manual`
- ◆ Configures services to log in using the specified domain user name and password
- ◆ Configures DataFabric Manager to access the data from the shared disk location, specified by using the `-d` option

The `-d` option performs the following actions:

- ❖ Moves the database files to a folder "data" and sets the `dbDir` and `dbLogDir` options accordingly
- ❖ Moves the Performance Advisor files to a folder "perfdata" and sets the `perfArchiveDir` option accordingly
- ❖ Moves the script plug-in files to a folder "script-plugins" and sets the `scriptDir` option accordingly
- ❖ Moves the storage system and NetCache configuration management plug-ins to a folder "plugins" and sets the `pluginsDir` option accordingly
- ❖ Moves the NetCache distribution files to a folder "cms" and sets the `cmsDir` option accordingly
- ❖ Moves the NetCache software files to a folder "software" and sets the `softwareDir` option accordingly
- ❖ Moves the NetCache configuration files to a folder "ncfile" and sets the `ncfileDir` option accordingly
- ❖ Moves the archived reports to a folder "Reports" and sets the `reportsArchiveDir` option accordingly

Second cluster node setup script

You use this cluster setup script to configure the second DataFabric Manager cluster node. Before running the script, ensure that you are logged in as the selected domain user. Verify that the second node owns all the cluster resources by reviewing the Resources details pane.

dfmcluster_secondnode.pl syntax:

```
perl dfmcluster_secondnode.pl <option> ...
```

For example, this script can be run as

```
$ perl dfmcluster_secondnode.pl -u "domain\dfmuser" -p ***** -d  
"S:\dfm"
```

Option	Description
-u <domain-user-name>	Domain user who has administrator privileges on the local system
-p <password>	Password for the domain user
-d <data-path>	Path to a destination folder in a shared data disk, to which the DataFabric Manager database and other files are moved This should be the same path as specified when running the dfmcluster_firstnode.pl script.

dfmcluster_secondnode.pl operations:

This cluster setup script performs the following operations:

- ◆ Configures services not to start automatically when the node boots up by setting service startup type to manual
- ◆ Configures services to log in using the specified domain user name and password
- ◆ Configures DataFabric Manager to access the database files from the shared disk location specified using the -d option. The database files are already moved to a folder “data” under this path by dfmcluster_firstnode.pl. This script sets the dbDir and dbLogDir options to point to this folder.

Add cluster resources setup script

You use this cluster setup script to add DataFabric Manager services as generic resources to the cluster. Run the script either on the first node or on the second node. Before running the script, ensure that you are logged in as the selected domain user. Verify that the current node owns all the cluster resources by reviewing the Resources details pane.

dfmcluster_add_resources.pl syntax:

```
perl dfmcluster_add_resources.pl <option> ...
```

For example, run this script as

```
$ perl dfmcluster_add_resources.pl -g "Cluster Group" -i "Cluster  
IP Address" -n "Cluster Name" -k "Disk S:"
```

Option	Description
-g <cluster-group>	Name of the cluster group to which the resources are added This should be the name of the group in which the other resources already exist.
-i <cluster-ip-resource>	Resource name of the Cluster IP resource as it appears under the Name column in the Cluster Administrator
-n <cluster-name-resource>	Resource name of the Cluster Name resource
-k <data-disk-resource>	Resource name of the Data Disk resource

dfmcluster_add_resources.pl operations:

This cluster setup script adds the following Generic Service resources to the MSCS configuration:

- ◆ DFM Sybase
- ◆ DFM Apache
- ◆ DFM Server
- ◆ DFM Event
- ◆ DFM Scheduler
- ◆ DFM Watchdog
- ◆ DFM Monitor

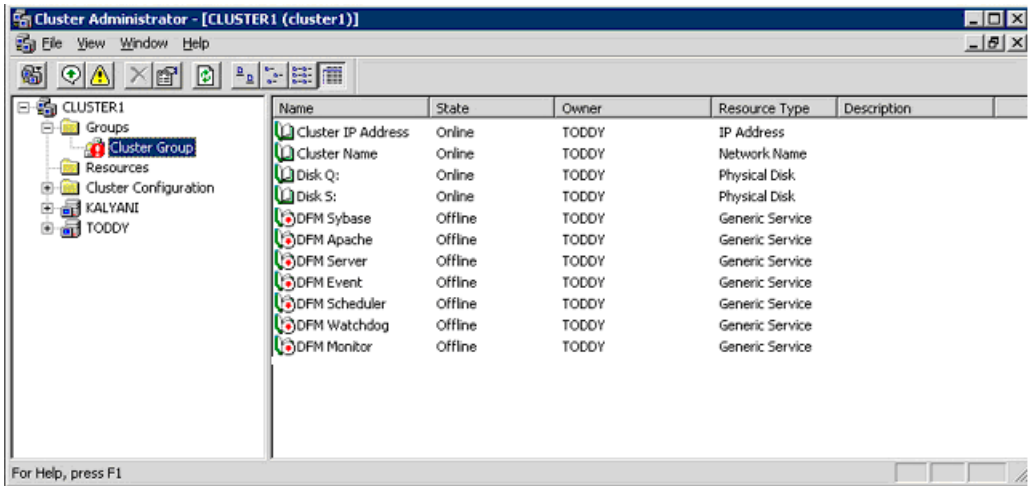
Bringing cluster services online

After you complete the setup scripts, DataFabric Manager with MSCS is ready, but the services are still offline.

To bring the cluster services online, do the following.

Step	Action
1	Select Cluster Group under the Groups folder and click File > Bring Online.

The following image is an example of Cluster Administrator displaying the Resource Types discussed previously, including the newly added Generic Services, shown as being offline.



Configuring DataFabric Manager to use the cluster name

By default, DataFabric Manager uses the local system name in the links in alert e-mail messages sent to administrators. The local system name is also used in NetCache configurations, configuration files, software, and distribution download URLs pushed to the NetCache appliances.

To make DataFabric Manager use the cluster name instead of the local system name, so that the URLs are always accessible, set the following options. It is suggested that you set both options, even if you are not managing NetCache appliances:

```
$ dfm option set localHostName=<fqdn-of-cluster>
$ dfm option set cacheUseDfmHostName=yes
```

Setting up DataFabric Manager with MSCS using manual steps

You can use this section as a checklist for manually setting up DataFabric Manager with MSCS. The advantage of using the following checklist is that you can customize the way the cluster is set up. For example, you can move the different DataFabric Manager data files (database files, Performance Advisor files) to different shared data disks. You cannot move the data files using the configuration scripts described in the earlier section.

Tasks involved of manual setup

The manual setup of DataFabric Manager with MSCS involves the following tasks:

- 1. Configure the first node.
- 2. Configure the second node.
- 3. Configure the cluster resources.

Configuring the first node to access all data files from a shared disk

You can access the shared data drive by logging in as a domain user with the appropriate privileges.

Note _____
By default, DataFabric Manager services run using the local system account. This default does not provide access to the shared drive where the database files and other files reside.

To configure the DataFabric Manager services to log in as a domain user with administrative privileges on the local system, complete the following.

Step	Action
1	Log in to the first node as the selected domain user with administrator privileges on the local system.
2	Ensure that the first node currently owns the resource group named Cluster Group. In the Cluster Administrator interface, check the Owner field of the Resources folder.

Step	Action
3	Enter the following command to stop DataFabric Manager services: \$ dfm service stop
4	Specify a Logon As user account. a. From the Start menu, select Control Panel. b. In the Control Panel, select Administrative Tools > Services. c. Double-click DFM Sybase ASA. d. In the General tab, change the Startup type option to Manual. Note _____ Setting the Startup type to manual is very important, because the services should not be started automatically on a node reboot. All service starting and stopping should be done only by the cluster server.
5	Click Apply.
6	Click the Log On tab.
7	Enter the name of the domain user account you want to use to access the DataFabric Manager service from the shared drive.
8	Click OK.

Step	Action
9	Repeat Step 4 through Step 8 for each additional service. Each time, replace the service name in Step 4c with one of the following services: ◆ DFM Apache ◆ DFM Server ◆ DFM Scheduler ◆ DFM Event ◆ DFM Watchdog ◆ DFM Monitor Note_____ Step 4 through Step 8 must be performed for all services, for the cluster to work properly. _____
10	Move the database files to a nonroot folder in the shared data drive. An example of a shared data folder is S:\dfm\data. The default location for database files is <i><installation-directory>\data</i>. Note_____ This step is required <i>only</i> on the first node you configure to be part of a cluster. _____
11	Point DataFabric Manager to the relocated database. Example: <pre>\$ dfm database set dbDir=S:\dfm\data \$ dfm database set dbLogDir=S:\dfm\data</pre>
12	Enter the following command to verify that all the services are still stopped: <pre>\$ dfm service list</pre>

Step	Action
13	Move all other data files to folders in the shared disk. ◆ Move the Performance Advisor data files to a folder in the shared data drive. The default location for performance data files is <i><installation directory>\perfdata</i> (for example, S:\dfm\perfdata). ◆ Move the Script plug-in files to a folder in the shared data drive. The default location for performance data files is <i><installation directory>\script-plugins</i> (for example, S:\dfm\script-plugins). ◆ Move the Configuration Management plug-in files to a folder in the shared data drive. The default location for plug-in files is <i><installation directory>\plugins</i> (for example, S:\dfm\plugins). ◆ Move the NetCache distribution files to a folder in the shared data drive. The default location for distribution files is <i><installation directory>\web\cms</i> (for example, S:\dfm\web\cms). ◆ Move the NetCache software files to a folder in the shared data drive. The default location for performance data files is <i><installation directory>\web\software</i> (for example, S:\dfm\web\software). ◆ Move the NetCache configuration files to a folder in the shared data drive. The default location for performance data files is <i><installation directory>\web\ncfile</i> (for example, S:\dfm\web\ncfile). ◆ Move the archived reports to a folder in the shared data drive. The default location for the archived reports is <i><installation directory>\reports</i> (for example, S:\dfm\reports).
14	Enter the following command to start the SQL service: <pre>\$ dfm service start sql</pre>

Step	Action
15	Set options to point DataFabric Manager to the new location of the relocated files. <pre>\$ dfm option set perfArchiveDir=S:\dfm\perfdata \$ dfm option set pluginDir=S:\dfm\plugins \$ dfm option set cmsDir=S:\dfm\cms \$ dfm option set softwareDir=S:\dfm\software \$ dfm option set scriptDir=S:\dfm\script-plugins \$ dfm option set ncfileDir=S:\dfm\script-plugins \$ dfm option set reportsArchiveDir=S:\dfm\reports</pre> Note_____ Do not start the services after setting each option as suggested by the messages printed by the <code>dfm option set</code> command. _____
16	Enter the following command to stop the SQL service. <pre>\$ dfm service stop sql</pre>

Configuring the second node to access all data files from the shared disk

You can access the shared data drive by logging in as a domain user with the appropriate privileges.

To configure the second node to log in as a domain user with administrative privileges on the local system, complete the following.

Step	Action
1	Log in to the second node as the selected domain user with administrator privileges on the local system.
2	Ensure that the second node currently owns the resource group named Cluster Group. In the Cluster Administrator interface, check the Owner field of the Resources folder.
3	Repeat Step 2 through Step 9 , and then Step 11 , as described in “ Configuring the first node to access all data files from a shared disk ” on page 50.

Step	Action
4	After you complete the previous steps, enter the following command to ensure that all the services are stopped: \$ dfm service list

Configuring DataFabric Manager services as cluster resources

After you install the DataFabric Manager services, you need to configure them as cluster resources and make them available to both nodes.

Prerequisite: Determine any dependencies that exist between various cluster resources. A dependency requires that one service be running before its associated service can be brought online. For example, most services cannot function unless Sybase ASA is already running.

To configure DataFabric Manager services as cluster resources, complete the following steps.

Step	Action
Log in, open Cluster Administrator, and select Resource	
1	Log in to the node as the selected domain user with administrator privileges on the local system.
2	Ensure that the node currently owns all the cluster resources. In the Cluster Administrator interface, check the Owner field of the Resources folder.
3	Open Cluster Administrator.
4	In the console tree, double-click the Groups folder.
5	In the details pane, click the group named Cluster Group.

Step	Action
6	On the File menu, select New > Resource. Select or type the appropriate options on each UI page, for each resource.
Install the cluster services, starting with the DFM Sybase ASA service	
7	On the New Resource page, complete the following steps. - Enter the name of the resource in the Name field. Example: Name = DFM Sybase ASA - Choose Generic Service as Service Type. - Select Cluster Group as the group. - Click Next.
8	On the Possible Owners page, complete the following. - Add both nodes as the possible owners of the resource. - Click Next.
9	On the Dependencies page, complete the following. - Add Dependencies related to the new service. Example: DFM Sybase ASA Dependencies = Cluster IP Address, Cluster Name, Disk S:, Data Disk - Click Next.

Step	Action
10	On the Generic Service Parameters page, complete the following. a. Set Service Name. Example: Service Name = DFM Sybase b. Leave the "Use Network name for computer name" option unchecked.
11	On the Registry Replication page, click Finish. There is no registry replication required.
Add the remaining cluster service	
12	Repeat Step 7 through Step 11 to add the remaining cluster services. The following table indicates Resource Name, Dependencies, and Service Name to enter for each new cluster service. Note _____ Step 7 through Step 11 must be performed for all services, for the cluster to work properly. _____

Resource Name field	Dependencies field	Service Name field
DFM Sybase ASA	Cluster I, Cluster Name, Shared Data Disk, Data Disk	DFMSybase
DFM Apache	DFM Sybase ASA	DFMApache
DFM Scheduler	DFM Sybase ASA	DFMScheduler
DFM Watchdog	DFM Sybase ASA	DFMWatchdog
DFM Server	DFM Sybase ASA	DFMServer
DFM Event	DFM Sybase ASA	DFMEvent
DFM Monitor	DFM Event	DFMMonitor

Bringing cluster services online (manual setup)

After you complete the manual setup, all the DataFabric Manager services are listed under the Cluster Group resource group. DataFabric Manager with MSCS is ready, but the services are still offline.

To bring the cluster services online, perform the following actions.

Step	Action
1	Select Cluster Group under the Groups folder and click File > Bring Online.

Configuring DataFabric Manager to use the cluster name (manual setup)

By default, DataFabric Manager uses the local system name in the links in alert e-mails sent to administrators. The local system name is also used in NetCache configurations, configuration files, software, and distribution download URLs pushed to the NetCache appliances.

To make DataFabric Manager use the cluster name instead of the local system name so that the URLs are always accessible, set the following options. It is suggested that you set both options, even if you are not managing NetCache appliances.

```
$ dfm option set localHostName=<fqdn-of-cluster>
$ dfm option set cacheUseDfmHostName=yes
```

Managing DataFabric Manager with MSCS

Ways to start and stop DataFabric Manager services

After you set up DataFabric Manager with MSCS, do not use the `dfm service start` and `dfm service stop` commands, except where specifically indicated in installation and configuration procedures. These commands interfere with the working of MSCS. Instead, you should perform all operations by using either the Cluster Administrator or the `cluster.exe` command.

Also, do *not* change the Service startup type to Automatic in the Service Control Manager on any of the nodes. Keep this option set to “manual.”

Backing up the DataFabric Manager database

The database backup improvements in DataFabric Manager 3.3 and later releases do not require you to stop the database service while backing up the database. Therefore, there are no additional steps to be performed to back up the database.

Restoring the DataFabric Manager database

To restore from an existing backup of the database, complete the following steps.

Step	Action
1	Log in to the node that currently owns the cluster resources.
2	Using Cluster Administrator, take the services offline: a. Right-click the DFM Sybase service. b. Select Take offline. This also takes the other services offline.
3	Enter the following command to restore the database: <code>\$ dfm backup restore</code>
4	Enter the following command to stop all the services: <code>\$ dfm service stop</code>

Step	Action
5	Using Cluster Administrator, bring the DataFabric Manager services online: a. Select Cluster Group under the Groups folder. b. Click File > Bring Online.

Setting up DataFabric Manager Web UI to use HTTPS

To set up DataFabric Manager Web UI to use HTTPS, complete the following steps.

Step	Action
1	Log in to the first node in the cluster.
2	Using Cluster Administrator, take the DataFabric Manager services offline. a. Right-click the DFM Sybase service. b. Select Take offline. This also takes the other services offline.
3	On the command line, enter the following command to start the SQL service: <pre>\$ dfm service start sql</pre>
4	Enter the following command to set up HTTPS, by creating an SSL certificate: <pre>\$ dfm ssl server setup</pre> This creates two files, server.crt and server.key, in the <i><install-dir>\conf</i> folder. Copy these files to the second node before starting the services on that node.
5	Enter the following command to enable HTTPS, by setting the DataFabric Manager option: <pre>\$ dfm option set httpsEnabled=yes</pre>

Step	Action
6	Enter the following command to start the HTTP service: <pre>\$ dfm service start http</pre> Starting the service using <code>dfm service start</code> re-creates the <code>httpd.conf</code> file with the changed options.
7	Enter the following command to stop all the services: <pre>\$ dfm service stop</pre> Note _____ Ensure that DataFabric Manager services are still in the offline status before proceeding. If the services are online, take them offline and then proceed to Step 8. Otherwise the HTTP service will fail to come up on the other node because the configuration is not complete.
8	Using Cluster Administrator, move the cluster group to the second node by using the Move Group option.
9	Log in to the second node in the cluster.
10	Copy the <code>server.crt</code> and <code>server.key</code> files created on the first node to the <code><install-dir>\conf</code> folder.
11	From the command line, enter the following command to start the services and verify they are operating properly: <pre>\$ dfm service start</pre> Starting the service by using <code>dfm service start</code> re-creates the <code>httpd.conf</code> file with the changed options.
12	Enter the following command to stop the services: <pre>\$ dfm service stop</pre>
13	Using Cluster Administrator, bring the DataFabric Manager services online: - Select Cluster Group under the Groups folder. - Click File > Bring Online.

Changing HTTP options

To change the HTTP options `httpEnabled`, `httpPort`, `httpsEnabled`, `httpsPort`, complete the following steps.

Step	Action
1	Log in to the first node in the cluster.
2	Using Cluster Administrator, take the DataFabric Manager services offline. a. Right-click the DFM Sybase service. b. Select Take offline. This also takes the other services offline.
3	From the command line, enter the following command to start the SQL service: <code>\$ dfm service start sql</code>
4	Enter the following command to set the required HTTP option: <code>\$ dfm option set <option-name>=<option-value></code> Example: <code>\$ dfm option set httpsPort=443</code>
5	Enter the following command to start the HTTP service: <code>\$ dfm service start http</code> Starting the service by using <code>dfm service start</code> recreates the <code>httpd.conf</code> file with the changed options.
6	Enter the following command to stop all the services: <code>\$ dfm service stop</code> Note — Ensure that DataFabric Manager services are still in the offline status before proceeding. If the services are online, take them offline and then proceed to Step 8 . Otherwise the HTTP service will fail to come up on the other node because the configuration is not complete.
7	Using Cluster Administrator, move the cluster group to the second node by using the Move Group option.
8	Log in to the second node in the cluster.

Step	Action
9	From the command line, enter the following command to start the services: \$ dfm service start
10	Enter the following command to stop the services: \$ dfm service stop
11	Using Cluster Administrator, bring the DataFabric Manager services online: a. Select Cluster Group under the Groups folder. b. Click File > Bring Online.

Monitoring DataFabric Manager with MSCS

Microsoft provides Server Clusters Management Pack as part of Microsoft Operations Manager. This provides the capability to monitor the cluster server, and to report node status, resource status, and alerts.

DataFabric Manager does not provide any additional cluster monitoring or alerting functionality.

Data that can be shared by DataFabric Manager cluster nodes

The following table describes what data can be shared by the DataFabric Manager cluster nodes.

You should configure DataFabric Manager nodes to access these files from a shared disk. If each node uses its own local copy of files, updates to files might not be accessible to the other nodes after a failover. For example, if a new storage system configuration management plug-in is installed on one node, it is accessible to only that node.

Default Folder Path	Description
<install-dir>\data	Sybase database files
<install-dir>\perfdata	Performance Advisor data files
<install-dir>\script-plugins	Installed script plug-ins and related files

Default Folder Path	Description
<install-dir>\plugins	Storage system and NetCache configuration plug-ins
<install-dir>\web\cms	NetCache distribution files
<install-dir>\web\software	NetCache software files
<install-dir>\web\ncfile	NetCache configuration files
<install-dir>\reports	Archived reports

Data that is not shared by DataFabric Manager cluster nodes

The following table describes what data is *not* shared by the DataFabric Manager cluster nodes.

Default Folder Path	Description
<install-dir>\bin	Executable files
<install-dir>\conf	Configuration files
<install-dir>\docs	Third-party licenses
<install-dir>\examples	Cluster configuration scripts, and so on.
<install-dir>\log	Log files
<install-dir>\misc	Configuration files
<install-dir>\sbin	Third-party executables
<install-dir>\scripts	Sybase_install.sql
<install-dir>\src	Storage system and NetCache configuration plug-ins
<install-dir>\web\clients	Performance Advisor clients
<install-dir>\web\com	JAR files for applets
<install-dir>\web\help	Online Help files
<install-dir>\web\man	Manual (man) pages
<install-dir>\web\media	Images used on Web interfaces

Default Folder Path	Description
<install-dir>\web\netcache	Required files from NetCache 5.3 plug-in
<install-dir>\web\scripts	Java script files
<install-dir>\web\styles	CSS style sheets

Uninstalling DataFabric Manager from a cluster

To uninstall DataFabric Manager from both the cluster nodes and disable the cluster setup, complete the following steps.

Step	Action
1	Using the Cluster Administrator, delete all the DataFabric Manager services: a. Right-click the DFM Sybase resource. b. Select Delete. This also deletes all other DataFabric Manager services.
2	Log in to either cluster node.
3	Select Uninstall from the Add/Remove Programs tool.
4	Complete the procedure for removing the program from your system.
5	Repeat Step 2 through Step 4 for the other cluster node.

Upgrading cluster nodes with DataFabric Manager

Upgrading DataFabric Manager cluster nodes

If you want to upgrade the cluster (active/active configuration) nodes, you should upgrade all the nodes together.

To upgrade all the nodes together, complete the following steps:

Step	Action
1	Using Cluster Administrator, take the DataFabric Manager services offline: a. Right-click the DFM Sybase service. b. Select Take offline. This takes the other services offline also.
2	To upgrade the first node, ensure that the first node currently owns all the non-DataFabric Manager cluster resources. In the Cluster Administrator interface, check the Owner field of the Resources folder.
3	Upgrade the DataFabric Manager installation on this node: a. Back up your existing DataFabric Manager database. b. Insert the DataFabric Manager 3.6 CD in your management station and launch dfmsetup-3-6-win32.exe in the /dfm/installer/ directory from the CD. c. Follow the DataFabric Manager setup prompts to complete the installation. See Chapter 2, “ Installing DataFabric Manager 3.6 on Windows ,” on page 16 for details.
4	Enter the following command to stop all the DataFabric Manager services: <code>\$ dfm service stop</code>

Step	Action
5	To upgrade the second node, ensure that the second node currently owns all the cluster resources that do not belong to DataFabric Manager. In the Cluster Administrator interface, check the Owner field of the Resources folder.
6	Upgrade the DataFabric Manager installation on the second node: - Back up your existing DataFabric Manager database. - Insert the DataFabric Manager 3.6 CD and launch dfmsetup-3-6-win32.exe in the /dfm/installer/ directory from the CD. - Follow the DataFabric Manager setup prompts to complete the installation. See Chapter 2, “Installing DataFabric Manager 3.6 on Windows,” on page 16 for details.
7	Enter the following command to stop all the DataFabric Manager services: <pre>\$ dfm service stop</pre>
8	Using Cluster Administrator, bring the DataFabric Manager services online: Select Cluster Group under the Groups folder and click File > Bring Online.

Microsoft Cluster Server parameters

To run DataFabric Manager with MSCS efficiently, it is important to understand and to set the cluster parameters appropriately. This section describes some of the parameters that are particularly useful to understand.

Generic service restart and failover parameters

DataFabric Manager services are added to the cluster as resources of the type Generic Service. For a Generic Service resource type, MSCS defines the following default parameters of the service on the Advanced tab of the Properties view:

Restart Action: Specifies the action to be taken by the MSCS service if the resource fails. You can set this property to Do Not Restart or Restart.

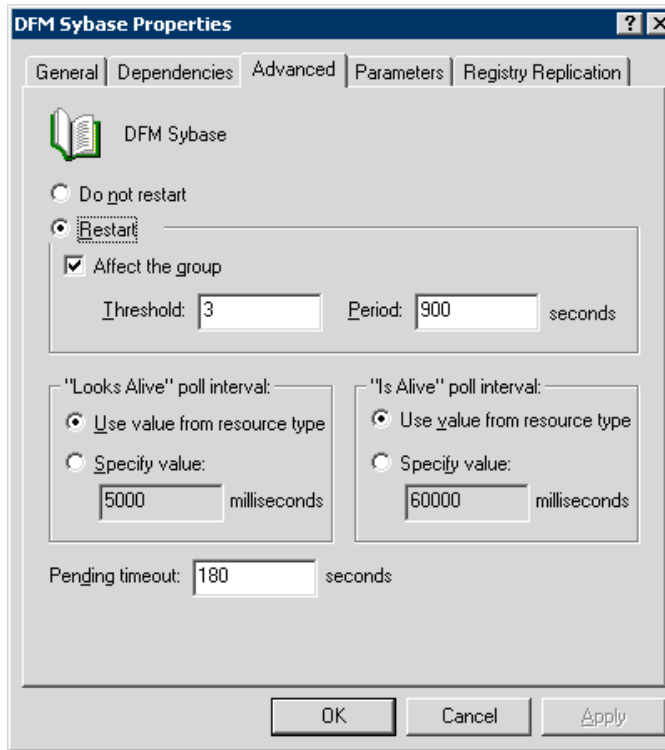
- ◆ **Affect the Group** property specifies whether the group should be failed over when this resource fails.
- ◆ **Restart Threshold** specifies the maximum number of restart attempts that can occur on a resource, within the interval defined by the Restart Period property. If the threshold and restart period are met, the MSCS service initiates the action specified by the Restart Action property (Do Not Start or Restart).
- ◆ **Restart Period** defines an interval of time, in milliseconds, during which a specified number of restart attempts can be made on a nonresponsive resource.

Looks Alive Poll Interval: Provides the recommended interval, in milliseconds, at which the MSCS service should poll the resource to determine whether it appears operational. Looks Alive polling performs basic polling to see whether the resource appears to be online.

Is Alive Poll Interval: Provides the recommended interval, in milliseconds, at which the MSCS service should poll the resource to determine whether it is operational. Is Alive polling performs thorough polling to see whether the resource is online and functioning.

Pending Timeout: Sets the number of seconds that a Resource Monitor waits for a resource in Online Pending or Offline Pending state before terminating the resource. For services that have long startup duration, you should specify a larger pending timeout value.

The following image is an example of the DFM Sybase Properties view, and it indicates the default values used for Generic Service. DataFabric Manager services use the same default values.



A summary of system behavior, based on the example in the image:

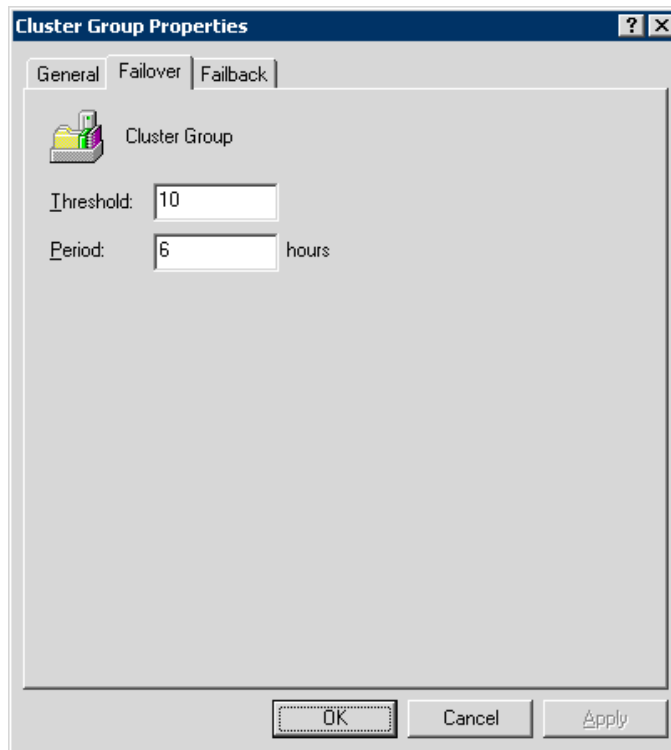
MSCS service waits for 180 seconds for a service to start up.

- ◆ After the service is online, MSCS performs Looks Alive polling every 5 seconds and Is Alive polling every 60 seconds. For a Generic Service resource, both these operations are performed by contacting the Service Control Manager.
- ◆ If a failure is detected for any service, the MSCS service tries to restart it.
- ◆ If the MSCS service has to restart the service three times in the duration of 15 minutes, it is considered a critical failure.
- ◆ Remaining services are brought offline and a cluster failover is initiated.

Repeated service failure parameters

In some conditions it is possible that the DataFabric Manager resource group can fail again, after the resource group fails over to the new node. This situation can result in a failover loop. The cluster group properties define when such repeated failovers should stop.

The following image is an example, and it shows the default settings for Cluster Group failover limits.

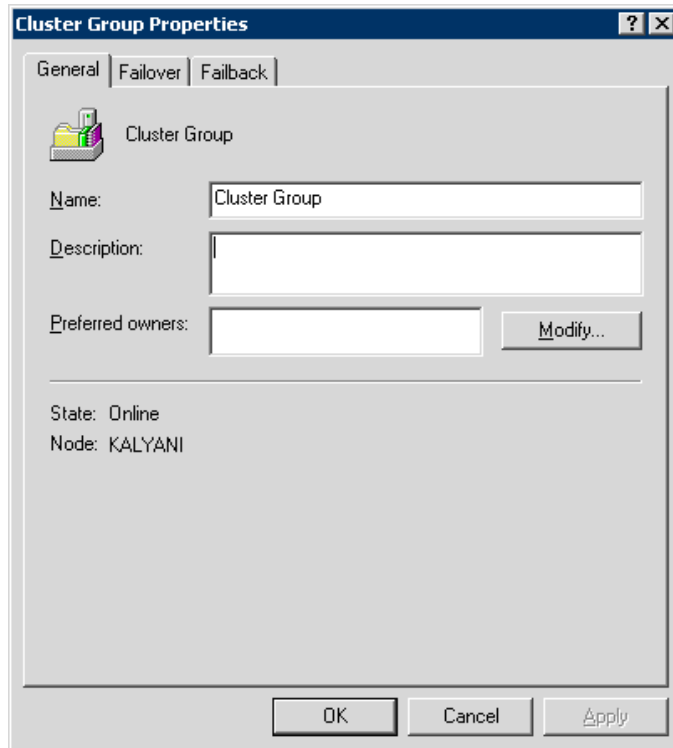


A summary of system behavior based on the example in the image:

Since the group failover Threshold is set to 10 and its failover Period is set to 6, the MSCS service fails over the group, for a maximum of 10 times within a 6-hour period. The 11th time a resource in the group fails, the cluster service fails all other resources in the group and leaves the entire group offline, instead of failing over the group.

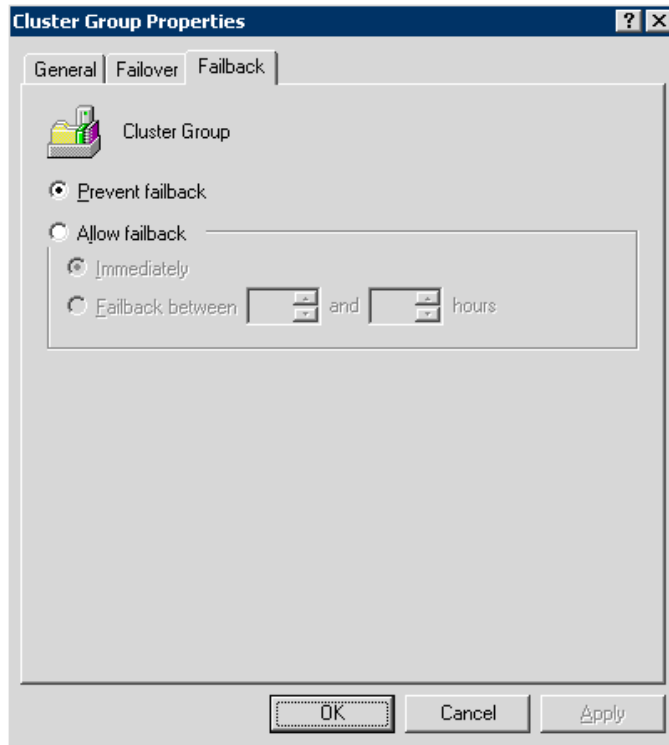
Node failback parameters

Preferred owners: For each resource group, you can specify a node as the preferred owner. You can specify the preferred owner node from the General tab of the Cluster Group Properties view, as shown in the following example (image). By default, the Preferred owners parameter is left empty.



Failback: Failback is the process by which the MSCS service moves a resource group back to its preferred node after the preferred node has failed and has come back online. You can set the failback parameter on the Failback tab of the Cluster Group Properties view, as shown in the following example (image). The options are Prevent Failback and Allow Failback. By default, groups are set to Prevent Failback.

If you want to enable failback, you can specify the failback to happen immediately after the preferred node comes online or during specific time periods (such as off-peak hours). For a failback to happen, you must specify a preferred node.



Additional reading

For more information about the MSCS requirements, guidelines, and management, see Microsoft's documentation at the following locations:

- ◆ The Microsoft Web site (www.microsoft.com):
 - ❖ Microsoft Operations Manager documentation
 - ❖ *Exchange Server 2003 Administration Guide*
 - ❖ Frequently Asked Questions
- ◆ The Microsoft TechNet Web site (technet.microsoft.com):
 - ❖ *Server Clusters Technical Reference*
 - ❖ *Windows 2003 Quick Start Guide for Server Clusters*
 - ❖ Frequently Asked Questions

Reasons to set up up for failover

DataFabric Manager is a business-critical tool for managing and configuring the data storage infrastructure. DataFabric Manager application relies on a single workstation. Setting up DataFabric Manager for failover ensures continued availability of DataFabric Manager functions by preventing the workstation from becoming a single point of failure.

Failover architecture

The failover architecture consists of two workstations running the same version of operating system and the same release of DataFabric Manager. The primary workstation is the machine on which DataFabric Manager runs, except after failover. The backup workstation is a dedicated machine that is on standby. It is used only in the event of DataFabric Manager failover. Each workstation is configured to use the same DataFabric Manager database stored on a disk system configured for redundancy.

How failover works

If the primary workstation fails, an administrator manually initiates takeover by the backup workstation.

Limitations

DataFabric Manager failover has the following limitations:

- ◆ Takeover does not occur automatically. You need to follow the takeover procedure described in this chapter.
- ◆ If certain operations are in progress at the time of failure, they will be interrupted. The operations which can be interrupted include SnapVault backup, content distribution, and NetCache configuration and software operations.
- ◆ It provides only the DataFabric Manager database to the backup workstation. It does not provide NetCache software images to the backup workstation. You must provide the NetCache software images through the procedures described in the chapter on remote configuration in the *Operations Manager Administration Guide*.
- ◆ It does not protect against database corruption.
Your best protection against corruption is to back up the DataFabric Manager database frequently, on a regular schedule.

Requirements

Failover deployment has the following requirements:

- ◆ You must run DataFabric Manager 2.3 or later.
- ◆ The primary and backup workstations must run the same version of operating system and the same release of DataFabric Manager.
- ◆ The primary and backup workstations must be in the same Windows or Network Information Service (NIS) domain.
- ◆ The filer mountpoints on both workstations should be automounted. This is useful when the machines reboot.
- ◆ The DataFabric Manager database must be on a disk system configured for redundancy, such as a filer cluster.
- ◆ You must monitor the primary workstation for failure using a third-party tool such as H-P OpenView or Big Brother.
- ◆ DataFabric Manager administrators must be domain users rather than local users, so authentication will still succeed in the event of failover.
- ◆ You must configure DNS for failover. See the following section.

No additional license is required for the backup workstation.

How to configure DNS for failover

There are two approaches to DNS configuration for failover: multiple IP addresses or a single IP address.

- ◆ **Multiple IP addresses:** The DNS name for DataFabric Manager can resolve to the IP address of either the primary workstation or the backup workstation. Appliances and browsers attempt to connect to the first IP address—the primary workstation. If they cannot connect to the first IP address, they retry using the second IP address—the backup workstation.
- ◆ **Single IP address:** The DNS name for DataFabric Manager resolves to the IP address of the primary workstation. You must manually update DNS in the event of failure.

DNS configuration for NetCache appliances in a neutral zone

The DNS configurations in this section do not apply to NetCache appliances that are located in a neutral zone—also known as a “demilitarized zone” or DMZ—between your company's private network and the outside public network. NetCache appliances that are located in a neutral zone must use the IP address of a workstation to connect with DataFabric Manager. The DNS resolver in the DMZ is pointed to public DNS, and the DNS name for DataFabric Manager is valid only on the private network.

Multiple IP addresses in DNS

You configure the DNS resolver with the IP addresses of both the primary and backup workstations. The following example illustrates multiple IP addresses in DNS.

```
dfm-service.company.com.    119    A      123.1.2.10
dfm-service.company.com.    119    A      123.1.4.10
```

Note You must enable the command-line option `cacheUseDFMHostName` when using multiple IP addresses. This option inserts into URLs either `localHostName`, if it is set, or the DataFabric Manager DNS host name.

Single IP address in DNS

When you use a single IP address in DNS, configure DNS with the IP address of the primary workstation only.

Note For this type of configuration, Network Appliance recommends a short TTL for DNS lookup results—5 minutes or less. The short TTL allows an updated DNS record to be effective fairly quickly, even though the previous DNS lookup result might be cached on a client machine or in the network infrastructure.

Setting up DataFabric Manager failover

The DataFabric Manager failover setup depends on the operating system where the DataFabric Manager server is installed.

Setting up DataFabric Manager failover on Linux or Solaris

If you are running DataFabric Manager on Linux or Solaris, complete the following steps to set up the DataFabric Manager failover.

Step	Action
1	Stop DataFabric Manager services on the primary workstation. Use the following command: <code>dfm service stop</code>

Step	Action	
2	Move the database file from its current location to the new location. The file name is monitordb.db. Its default location is <i>installation directory/data/</i> ; however, you may have chosen a different location at the time of installation.	
3	Point DataFabric Manager to the relocated database. Use the following command: dfm database set dbDir=<database location>	
4	Restart DataFabric Manager services. Use the following command: dfm service start	
5	If...	Then...
	You are using the single IP address configuration in DNS	Complete the following optional steps if you want a DNS alias for the workstation: a. Configure a DNS alias for the DataFabric Manager server station to point to the IP address of the primary workstation. b. Specify the DNS alias you set for the DataFabric Manager server as the name of the local workstation to be used in URLs for e-mail alerts. Use the following command: dfm option set localHostName=<dns-alias>
	You are using the multiple IP address configuration in DNS	Go to Step 6 .

Step	Action	
6	If...	Then...
	Your network setup allows NetCache appliances to look up the DataFabric Manager server DNS name and resolve it to an IP address, and you are running DataFabric Manager 3.6	Enable use of the DataFabric Manager server DNS host name in the address that NetCache uses to communicate with the workstation. Use the following command: dfm option set cachUseDfmHostName=yes
	Your network setup does not allow the DNS name resolution described in this step, or you are running DataFabric Manager 2.2 or earlier	Go to Step 7 .
7	Install DataFabric Manager on the backup workstation.	
8	Configure the backup workstation by repeating Step 1 through Step 5. If you are using the multiple IP address configuration in DNS, repeat Step 7. Services will fail to start on the backup workstation, because the primary workstation is already using the database. You will see an error message stating that the primary workstation might already be running. If the service starts successfully, the failover configuration is not correct. Check the location of the database that you entered for the backup workstation.	

Step	Action
9	Put the backup workstation into standby mode by stopping DataFabric Manager services. Use the following command: <pre>dfm service stop</pre> Note_____ You need to perform this step even if the services failed to start in Step 8. Only the SQL services fail because the database is already in use. Other DataFabric Manager services have started that do not need to be running on the backup workstation.

If you are running DataFabric Manager on Windows, complete the following steps to set up the DataFabric Manager failover.

Step	Action
1	Log in as a user who has access to the CIFS share on which the database files are to be stored.
2	Go to Control Panel > Administrative Tools > Computer Management > Local Users and Groups > Groups > Administrators, to add the CIFS user as a part of Administrators group on the DataFabric Manager server. The Administrator Properties dialog box is displayed.
3	Click Add.
4	The Select Users, Computers, or Groups dialog box is displayed.
5	Type the user name.
6	Click OK.
7	Stop DataFabric Manager services on the primary workstation. Use the following command: <pre>dfm service stop</pre>
8	Create a folder inside the CIFS share.

Step	Action
9	Use the following command to know the current path of the database files: dfm database get
10	Copy the database files from their current location to the folder created inside the CIFS share. The format of the path is as follows: \\<filer>\<share>\<data_dir>
11	Use the following command to set the dbLogDir option to the CIFS share where the database files (monitordb.log and monitordb.db) are stored: dfm database set dbLogDir="\\<filer>\<share>\<data_dir>"
12	Use the following command to set the dbDir option to the CIFS share: dfm database set dbDir="\\<filer>\<share>\<data_dir>" Note _____ If you do not set the dbLogDir option in DataFabric Manager before setting the dbDir option, then a new database log file (monitordb.log) gets created in the path specified by dbDir option. _____
13	Go to Settings > Control Panel > Administrative Tools > Services, to specify a Windows user account for DataFabric Manager service on the primary workstation. The Services dialog box is displayed. Note _____ If DataFabric Manager runs using the local system account (the default), it might not be able to access the shared drive where the database will reside. _____
14	Double-click DFM Sybase ASA. The DFM Sybase ASA Properties dialog box is displayed.
15	Click the Log On tab.
16	Click the This Account option.
17	Type the user name and password of a user having access to the CIFS share.

Step	Action
18	Click OK.
19	Start the DFM Sybase ASA service using the following command: dfm service start sql
20	Use the following command to know the current location of the perfArchiveDir option: dfm option list perfArchiveDir
21	Copy the performance archive directory from its current location to the CIFS share.
22	Use the following command to set the perfArchiveDir option in DataFabric Manager to the performance archive directory location inside the CIFS share: dfm option set perfArchiveDir="\\<filer>\<share>\<perfdata>" Note _____ Do not start the server service at this stage. _____
23	Use the following command to know the current location of the scriptDir option: dfm option list scriptDir
24	Copy the script-plugins directory from its current location to the CIFS share.
25	Use the following command to set the scriptDir option in DataFabric Manager to the CIFS share: dfm option set scriptDir="\\<filer>\<share>\<script-plugins>" Note _____ Do not start the server and the scheduler services at this stage. _____

Step	Action
26	Change the Log On settings for all the DataFabric Manager services as follows: a. Go to Settings > Control Panel > Administrative Tools > Services. b. Double-click the service name. c. Click the Log On tab. d. Click the This Account option. e. Type the user name and password of a user having access to the CIFS share. f. Click OK. The following are the DataFabric Manager services (service names): ◆ DFM Server ◆ DFM Scheduler ◆ DFM Monitor ◆ DFM Event ◆ DFM Watchdog ◆ DFM Apache

Step	Action	
27	If...	Then...
	You login from Operations Manager and have authentication problems on Windows 2000, when the Log On for DFM Apache service is changed	Complete the following steps: a. Go to Control Panel > Administrative tools > Local Security Policy > Local Policies > User Rights Assignment. b. Under the Policy column, double-click Act as part of the operating system. The Act as part of the operating system Properties dialog box is displayed. c. Click Add User or Group. The Select Users or Groups dialog box is displayed. d. Provide the credentials given in the Log On for DFM Apache. e. Click OK.
28	Start the DataFabric Manager services using the following command: dfm service start	

Takeover procedure After failover is set up, complete the following steps to initiate takeover by the backup workstation if the primary workstation fails.

Step	Action
1	Release the locks on the database held by the primary workstation by entering one of the following commands at the filer command line: ◆ For workstations using NFS: <code>sm_mon <client-name></code> ◆ For workstations using CIFS: <code>cifs-terminate <computer-name></code>
2	Start DataFabric Manager on the backup workstation using the following command: <code>dfm service start</code>

Giveback procedure When the primary workstation is ready to resume service, complete the following steps to perform the giveback procedure.

Step	Action
1	Stop DataFabric Manager services on the backup workstation. Use the following command: <code>dfm service stop</code>
2	Release the locks on the database held by the backup workstation by entering one of the following commands at the filer command line: ◆ For workstations using NFS: <code>sm_mon <client-name></code> ◆ For workstations using CIFS: <code>cifs-terminate <computer-name></code>
3	After DataFabric Manager services are stopped on the backup workstation, restart services on the primary workstation. Use the following command: <code>dfm service start</code>

Available documentation

The following list describes available DataFabric Manager user documentation.

Online Help:

After you install or upgrade the DataFabric Manager software, you can access the following online Help:

- ◆ Operations Manager online Help:
 - Click the Help icon on any Operations Manager page.
- ◆ Performance Advisor online Help:
 - ❖ Install NetApp Management Console.
 - ❖ Click the Help icon on the Performance Advisor toolbar.
- ◆ Protection Manager online Help:
 - ❖ Activate the Protection Manager license.
 - ❖ Install NetApp Management Console.
 - ❖ Click the Help icon on the Protection Manager toolbar.

Administration Guides:

The administration guides are available in the printed and electronic (CD) form. Both forms are in the software and documentation package you received with your product. If you did not receive a software and documentation package, you can order a package through your sales representative.

You can also find the guides at <http://now.netapp.com>.

Additional information available about DataFabric Manager

The following resources provide additional information about Operations Manager, File SRM, Business Continuity Option, and DataFabric Manager:

- ◆ Operations Manager *Administration Guide*
- ◆ Man pages which are available in the online Help
- ◆ Frequently asked questions (FAQs)
- ◆ Performance Advisor *Administration Guide*
- ◆ Protection Manager *Administration Guide*
- ◆ The NOW site

Accessing the online Help

By default, the *compact* online Help window opens when you select Help and click About This Page. The compact window displays only the Help topic, while the full window includes the Table of Contents. To switch between the full and compact online Help windows, click Show.

Using the FAQs

The online Help includes FAQs that provide answers to many typical questions regarding software installation and features. It is also available from the NOW site.

Accessing the Performance Advisor online Help

The Performance Advisor online Help provides information about the Performance Advisor user interface and system administration tasks such as viewing and working with performance data, customizing performance data views, preserving performance data for analysis, and so on.

The NOW site

The NOW site features an array of self-service support tools, including the following:

- ◆ PDF and HTML versions of DataFabric Manager documentation
- ◆ Online technical assistance
- ◆ Software downloads
- ◆ Online service contract options
- ◆ My NetApp Products, from which you can register and keep track of your installed products, licenses, and service contracts, as well as training and product programs

You can access the NOW site from Operations Manager by clicking the NOW Customer Service link in the upper right side of the window.

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